Elwha Water Treatment Plant

Water Quality Mitigation Projects - **Elwha Water Treatment Plant**
Text for inclusion in the Elwha River Restoration Project JARPA
All bold text is copied from the JARPA application. All responses are in normal text.

SECTION 2

4. NAME, ADDRESS, AND PHONE NUMBER OF PROPERTY OWNER(S), IF OTHER THAN APPLICANT.
City of Port Angeles

5. LOCATION (STREET ADDRESS, INCLUDING CITY, COUNTY AND ZIP CODE, WHERE PROPOSED ACTIVITY EXISTS OR WILL OCCUR)
Washington State Fish and Wild Life Department Rearing Channel, Crown Z Road, Port Angeles, Washington 98363.

LOCAL GOVERNMENT WITH JURISDICTION (CITY OR COUNTY)
Clallam County

WATERBODY
Elwha River

TRIBUTARY OF
N/A

WRIA#
18

¼ SECTION
SE 1/4

SECTION
3

TOWNSHIP
30N

RANGE
7W

SHORELINE DESIGNATION
Conservancy

TAX PARCEL NUMBER
See Ownership List

ZONING DESIGNATION
RCC5

DNR STREAM TYPE, IF KNOWN
F

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6. DESCRIBE THE CURRENT USE OF THE PROPERTY, AND THE STRUCTURES EXISTING ON THE PROPERTY. IF ANY PORTION OF THE PROPOSED ACTIVITY IS ALREADY COMPLETED ON THIS PROPERTY, INDICATE THE MONTH AND YEAR OF COMPLETION.

The City of Port Angeles Ranney Collector, with its associated control center building, 24" pipeline, and diesel fuel tank, is located near the north end of the site. These structures are used to supply water to the Port Angeles Water Treatment Plant. See Figures 3 and 4.

There are several storage buildings present at the northeast end of the site, on Halberg family property. Next to these buildings is a screen house which screens water flowing between the industrial diversion channel (at the east side of the site) and the North Waterway. See Figure 4.

There is a set of catwalks and concrete structures present at the north end of the site, which serves as part of the Washington State Department of Fish and Wildlife (WDFW) fish spawning nursery infrastructure, see Figures 3 and 4. The WDFW rearing channel extends from the north to the south, in the middle of the site, and is flanked on both sides by asphalt paving, see Figures 4 through 7. At the opposite end of the rearing channel (near the south end of the site), there is a concrete channel intake structure which allows water to flow into the rearing channel from the industrial channel, see Figure 7. At the southeast side of the site, east of the industrial diversion channel and west of the wetland, there is a fenced paved and lawn area containing several buildings, including garages, mobile homes, an office/shop, a diesel tank, and a septic drainfield. This area serves as WDFW operations, see Figure 6.

Extending from the north to the south ends of the site, on the east side, is the industrial diversion channel, flanked on the west by a gravel road and on the east partly by a wetland, see Figures 4 through 6. At the south end of the industrial diversion channel is a concrete structure which allows water to flow between the diversion channel and the South Waterway, see Figure 6.

There is a paved access road at the south end of the site, which extends along the west side of the rearing channel. A gravel road forks off the paved road at the south end of the site, which leads to the WDFW operations area, see Figures 6 and 7.

There are several water wells between the Elwha River and the south end of the rearing channel. These wells feed water pipes which flow to the north and south ends of the rearing channel, see Figure 7.

There are overhead and buried lines which carry one or more of power, communication, or telephone, at several locations onsite. An overhead power line runs north from the paved access road at the south end of the site, about 100' west of the rearing channel, and feeds a transformer next to a catwalk near the WDFW fish trap. A line tees off of this line, and extends to the northeast across the rearing channel, industrial diversion channel, and up the hill at the northeast corner of the site. Another line tees off the line and feeds the Ranney Well operations building. There is a buried phone line which extends from the access road at the south end of the site, runs about 50' north of the South Waterway, and extends along the west side of the industrial diversion channel. This tees off at the north end of the rearing channel, and feeds into the Ranney Well operations building. Another buried phone line extends from the same road, northward along the west side of the rearing channel, also feeding into the Ranney Well operations building. A buried power line runs from the south end to the north end of the rearing channel, about 50' east of the rearing channel. See Figures 4 through 7 for utility line information.

IS THIS PROPERTY ON AGRICULTURAL LAND?

No

ARE YOU A USDA PROGRAM PARTICIPANT?

No

7.a. DESCRIBE THE PROPOSED CONSTRUCTION AND/OR FILL WORK FOR THE PROJECT THAT YOU WANT TO BUILD THAT NEEDS AQUATIC PERMITS: COMPLETE PLANS AND SPECIFICATIONS SHOULD BE PROVIDED FOR ALL WORK WATERWARD OF

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THE ORDINARY HIGH WATER MARK OR LINE, INCLUDING TYPES OF EQUIPMENT TO BE USED. IF APPLYING FOR A SHORELINE PERMIT, DESCRIBE ALL WORK WITHIN AND BEYOND 200 FEET OF THE ORDINARY HIGH WATER MARK. ATTACH A SEPARATE SHEET IF ADDITIONAL SPACE IS NEEDED.

(NOTE: all amounts of excavation, fill, etc. are approximate, and all activities involving the industrial channel being dewatered are likely to occur simultaneously or sequentially, so that the channel only needs to be dewatered one time).

Slurry Outfall Structure

The only structure which will extend past the Ordinary High Water Mark (OHWM) is the slurry outfall structure. The slurry outfall structure will release into the Elwha River the slurry (water containing sand and silt) that has been removed during the water treatment process. The structure will be constructed by erecting a temporary dam in the Elwha River around the proposed location of the outfall. The area within the dam will be dewatered by pumping. The area will then be excavated as required (171 cubic yards (cy)), using a hydraulic excavator or similar conventional earthmoving equipment operated from the shore. Then the outfall structure will be constructed out of precast concrete, 73 cy of riprap and filter stone, 60 cy of boulders, and 20 cy of grout. Finally, the temporary dam will be removed. Drawings of this structure are included in Figure 8.

Several structures will contact the water features which drain into the Elwha River. These structures are not within 200 feet of the OHWM of the Elwha River, but do contact channels which feed into the Elwha River. These structures are described as follows:

Vortex Boulder Weir

The vortex boulder weir will moderate water flow from the north overflow structure channel to the North Waterway, which then feeds into the Elwha River. The weir will allow some flow to be diverted to the WDFW rearing channel for fish attraction purposes. The weir will be constructed by erecting a temporary dam in the north waterway, dewatering the area, and excavating 27 cy via a hydraulic excavator or similar conventional earthmoving equipment. Then the weir will be constructed from 9 cy of boulders and 20 cy of gravel. Then the temporary dam will be removed. Drawings of this structure are included in Figure 9.

North Overflow Structure

The north overflow structure will encase effluent and slurry pipes, and control the flow between the industrial channel and the north waterway, which then feeds into the Elwha River. The structure will be constructed by dewatering the industrial channel, excavating 192 cy of material using a hydraulic excavator or other similar conventional earthmoving equipment, and constructing a concrete wall and vault, 900 cy of fill material, effluent and slurry pipes, and 90 cy of riprap and filter stone. Drawings of this structure are included in Figure 10.

Industrial Channel Apron Extension

The industrial channel apron extension will be required to protect the north end of the industrial channel from erosion and seepage. The structure will be constructed by dewatering the industrial channel. Then the structure will be excavated (48 cy) via a hydraulic excavator or similar earthmoving equipment. Then geotextile will be placed. Then the structure will be backfilled with the previously excavated material or compacted fill (48 cy). Finally, geomembrane will be placed on top of the structure. Drawings of this structure are included in Figure 13.

Industrial Channel Divider Dam

The industrial channel divider dam will separate the industrial channel into two sections to allow for storage of treated water and stormwater treatment. The structure will be constructed first by dewatering the industrial channel. Then, 1,000 cy of external dam fill will be placed to provide the structure. Then 100 cy of internal dam fill with geomembrane will be placed, followed by a covering of 200 cy external dam fill. Finally, a crushed rock surfacing top course will be placed on top to serve as a road. Drawings of this structure are included in Figure 10.

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Wetland Dam and Flow Control Weir
The wetland dam and flow control weir will act as a regulator between the adjacent wetland and the industrial channel to maintain the existing wetland as it currently operates. The structure will be constructed first by dewatering the industrial channel and placing a temporary dam on the wetland side. Then the structure will be excavated (1 cy) using a hydraulic excavator or other similar earthmoving equipment. This excavation will widen the weir area and decrease the slope. Then the structure will be constructed using 4 cy of compacted fill and 22 cy of riprap. Finally the temporary dam will be removed. Drawings of this structure are included in Figure 12.

Effluent Outfall Structure
The effluent outfall structure will armor the effluent pipe as it enters the industrial channel. The structure will be constructed by first dewatering the industrial channel. Then the area will be excavated (273 cy) using a hydraulic excavator or other similar earthmoving equipment to fit the structure. Then, the pipe will be laid, and finally, the structure will be backfilled with 224 cy of fill, and lined with 36 cy of riprap and filter stone. Drawings of this structure are included in Figure 10.

Industrial Channel Modification
A portion of the industrial channel will be used for stormwater treatment. A road will be required to be placed next to the channel, and a portion of the road will be relocated within the existing industrial channel. To accomplish this, the industrial channel will be dewatered. Then, 2,732 cy of fill material will be filled and a culvert laid. Then, 868 cy of riprap and filter stone will be placed next to the channel to prevent erosion. A crushed rock surfacing top course will be placed on top of the filled material. Finally, the east access road will be constructed. Drawings of this structure are included in Figures 5 and 11.

Stormwater Outlet Control Structure
The stormwater outlet control structure will be used to regulate the discharge of the site stormwater before discharging it into the North Waterway. The structure will be constructed by first dewatering the industrial channel. Then the required area (258 cy) will be excavated using a hydraulic excavator or other similar earthmoving equipment. Then a geotextile will be laid down, followed by 1 cy crushed rock. Then the stormwater pipe will be laid, followed by the precast concrete manhole structure. Finally, the area will be backfilled with 191 cy of fill. Drawings of this structure are included in Figure 15.

Attraction Flow Channel and North Waterway Modification
The attraction flow channel allows water to flow from the north waterway to the WDFW rearing channel outlet. 1,046 cy of material will need to be dredged/excavated out of this channel to allow for the designed water flow. Approximately 350 square feet of wetlands will be impacted to accomplish this. The dredged material will be disposed of offsite. To accomplish the construction of this channel, the ends of the channel will have temporary dams placed. Then the channel will be dewatered. Then a hydraulic excavator or other similar conventional earthmoving equipment will be used to remove the material. Finally, the temporary dams will be removed. Drawings of this modification are included in Figures 3 and 4.

Influent Pump Station
The influent pump station (IPS) will house the pumps and related equipment which will be required to lift influent water into the treatment plant. It will draw water from the ESWI structure directly to the southwest, and discharge to a pipe leading to the chemical mix tanks. This structure will be constructed by excavating approximately 2,441 cy of material, pouring concrete to house the pump wetwell and a concrete slab foundation for the building, and then constructing the building on the slab. Drawings of this structure are included in Figure 14.

Other Structures
All onsite structures other than the ones mentioned above are neither within 200 feet of the OHWM of the Elwha River, nor do they come into contact with the channels which feed into the Elwha River. However, these structures **do** lie within 200 feet of the channels which feed into the Elwha River. These structures are described as follows:

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There will be a parking area constructed east of the north end of the rearing channel. EWTP Operations buildings and equipment will be located next to this parking area. These include the office/laboratory building, the chemical feed and storage building, several chemical tanks which will house chemicals (caustic soda, sulfuric acid, polyaluminum chloride, and polymer) required for the water treatment process, a diesel generator and tank, an electrical transformer, and the effluent flow distribution structure which will contain various basins and gates to allow distribution of water to the various users.

To the south of the parking area but still between the industrial channel and the rearing channel, several large tanks will be constructed. The four largest round tanks (110' diameter, 14' height) will be the sedimentation tanks, where most solids are removed from the influent water. East of the sedimentation tanks, there will be seven smaller tanks (14' diameter, 17' height) which serve as mixing tanks for the chemicals which enter the process. Between the sedimentation tanks lie two buildings which house the slurry pumps. These take the slurry from the sedimentation tanks and pump to the slurry outfall in the far northwest corner of the site.

In order to construct these structures, various cut and fill operations will be conducted utilizing conventional earthmoving equipment such as hydraulic excavators, bulldozers, backhoes, scrapers, cement trucks, etc.

Swales and culverts will be constructed as shown on Figures 3 through 7 and 11.

Process and treated water piping will be constructed as shown on Figures 3 through 7.

Temporary Erosion and Sedimentation Control (TESC), Grading, and Drainage Plan drawings have been prepared and TESC specifications have been written. EWTP drawings C-2.1 through C-2.5 and Specification 02370: Temporary Erosion and Sedimentation Control are available upon request.

A stormwater site plan was created according to the Department of Ecology's Stormwater Management Manual for Western Washington (2001). Stormwater from the site will be collected and conveyed to a wetpond located in the southern part of the industrial channel. This wetpond will address stormwater detention as well as water quality requirements. The stormwater site plan is shown on Figures 3 through 7, and stormwater design calculations are available upon request.

7.b. DESCRIBE THE PURPOSE OF THE PROPOSED WORK AND WHY YOU WANT OR NEED TO PERFORM IT AT THE SITE. PLEASE EXPLAIN ANY SPECIFIC NEEDS THAT HAVE INFLUENCED THE DESIGN.

The Elwha River Ecosystem and Fisheries Restoration Project includes the removal of the Elwha and Glines Canyon Dams from the Elwha River near Port Angeles, Washington. The Elwha Water Treatment Plant (EWTP) will provide treated water to the existing end users (the WDFW rearing channel and the Nippon Paper Industries paper mill) and to a new user (the Lower Elwha Klallam Tribal Hatchery). The EWTP will also serve as a backup supply to the City of Port Angeles Water Treatment Plant. The EWTP will operate during the dam removal and erosion period, which begins with the dam removal and is expected to extend for three to five years. The design criteria consider the planned three to five year continuous operating period.

This particular site was selected for the construction of the EWTP because of its proximity to existing infrastructure and the Elwha Surface Water Intake (ESWI). Existing infrastructure includes the Ranney Collector Well and associated pipelines, the WDFW rearing channel, the industrial channel, the intake supply tunnel, and the industrial pipeline to downstream users.

The EWTP Project includes construction of a water treatment plant and all associated structures. Only one structure (not including the ESWI structure, addressed in a separate division of this JARPA application) to be constructed on the EWTP site will lie within the ordinary high water mark (OHWM) of the Elwha River. There are numerous waterways and streams onsite which feed into the Elwha River, and all of the structures onsite will be within 200 feet of these river-connected water features.

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7.c. DESCRIBE THE POTENTIAL IMPACTS TO THE CHARACTERISTIC USES OF THE WATER BODY. THESE USES MAY INCLUDE FISH OR AQUATIC LIFE, WATER QUALITY, WATER SUPPLY, RECREATION AND AESTHETICS. IDENTIFY PROPOSED ACTIONS TO AVOID, MINIMIZE, OR MITIGATE DETRIMENTAL IMPACTS, AND PROVIDE PROPER PROTECTION OF FISH AND AQUATIC LIFE. ATTACH A SEPARATE SHEET IF ADDITIONAL SPACE IS NEEDED.

Short-term Impacts due to Construction Include:

- Temporary increase in suspended sediments and turbidity potentially affecting fish and aquatic life and water quality.
- Localized modification of river hydrology potentially affecting fish and aquatic life.
- Temporary removal of riparian vegetation potentially affecting aquatic life and the aesthetic character of the riparian area.

Long-term Impacts Include:

- Alteration of the character of the streambed and the river hydrology affecting fish and aquatic life.

Mitigation Measures during Construction Include:

- Minimizing the impacts to existing, healthy vegetation to the extent possible.
- Use of proactive and reactive BMP's at the site.
- Use of berms, dikes and silt fencing to isolate the construction area from the river.
- Work during low flow conditions.
- Work within fish windows established by WDFW.
- Mulches and erosion control fabrics will be used in highly erosive areas.
- Use of bioengineered techniques for river bank stability where practicable.
- Boulders and woody debris may be strategically placed along the bank to provide dispersion of surface runoff and to create micro-habitats for plant and wildlife species.

Mitigation Measures for Long-Term Impacts Include:

- Selected riparian plant species will be compatible with the overall management objectives of the Elwha River corridor. Plant species will be carefully matched to the soil and sun exposure for which they are best suited.
- Use of local nursery stocks will be emphasized.

8. WILL THE PROJECT BE CONSTRUCTED IN STAGES?

Yes

PROPOSED STARTING DATE:

08/2006

ESTIMATED DURATION OF ACTIVITY:

2-years

9. CHECK IF ANY STRUCTURES WILL BE PLACED:

WATERWARD OF THE ORDINARY HIGH WATER MARK OR LINE FOR FRESH OR TIDAL WATERS.

Yes. A portion of the slurry outfall structure will be located waterward of the ordinary high water mark.

WATERWARD OF MEAN HIGH WATER LINE IN TIDAL WATERS:

No.

10. WILL FILL MATERIAL (ROCK, FILL, BULKHEAD, OR OTHER MATERIAL) BE PLACED:

WATERWARD OF THE ORDINARY HIGH WATER MARK OR LINE FOR FRESH OR TIDAL WATERS.
Yes. The portion of the slurry outfall structure which lies waterward of the ordinary high water mark will be constructed of filter stone, riprap, boulders, and grout.

WATERWARD OF MEAN HIGH WATER LINE IN TIDAL WATERS.
No.

11. WILL MATERIAL BE PLACED IN WETLANDS?
No.

G. WILL PROPOSED ACTIVITY CAUSE FLOODING OR DRAINING OF WETLANDS?
Yes, the attraction flow channel and North Waterway modifications will cause flooding of approximately 350 square feet of wetlands.

The construction of the wetland dam and flow control weir is included for the purpose of **preventing** the draining of the adjacent wetlands.

13. WILL EXCAVATION OR DREDGING BE REQUIRED IN WATER OR WETLANDS?
The construction of the slurry outfall structure will require excavation past the OHWM of the Elwha River. However, the area to be excavated will be temporarily dammed and dewatered prior to this excavation.

The attraction flow channel and North Waterway modifications will require dredging in water and minimal excavation in Wetland F. See the response to question 7a, above, for more detail on this activity.

The construction of the wetland dam and flow control weir will occur directly adjacent to Wetland C. This structure is being constructed specifically to maintain the wetland as it currently operates. During construction of this structure, there may be some minimal temporary impact to the far northwestern corner of the wetland. If there is impact, the wetland will be restored following construction.

Several other structures will be constructed onsite which will require excavation in water. These include the vortex boulder weir, the north overflow structure, the industrial channel apron extension, the industrial channel divider dam, the wetland dam and flow control weir, the effluent outfall structure, the industrial channel modification, the stormwater outlet control structure, and the influent pump station. See the response to question 7a, above, for more detail on each of these structures.

A. VOLUME:
Approximately 26 cubic yards will be excavated from beyond the OHWM of the Elwha River for construction of the slurry outfall structure. Approximately 30 cubic yards will be excavated from the existing wetland next to the North Waterway. See the response to question 7a, above, for more detail on excavation and dredging volumes for other structures.

AREA:
Approximately 300 square feet of area past the OHWM of the Elwha River will be affected by the slurry outfall structure. Approximately 350 square feet of wetlands will be affected by the attraction flow channel and North Waterway modifications. See the response to question 7a, above, for more detail on areas of other structures.

B. COMPOSITION OF MATERIAL TO BE REMOVED:
River alluvium and minimal amounts of topsoil.

C. DISPOSAL SITE FOR EXCAVATED MATERIAL:

River alluvium will be used for backfill in connection with the EWTP construction if it meets the specifications for fill material (available upon request). If excess or off-spec material is excavated, it will be disposed of at approved upland or offsite locations.

D. METHOD OF DREDGING

Hydraulic excavation or similar conventional earthmoving equipment.